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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,588	11/09/2001	Chi-Meng Liao	DED/3073/56	5811

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EXAMINER

BURCH, MELODY M

ART UNIT	PAPER NUMBER
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3683

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,588

Applicant(s)

LIAO, CHI-MENG

Examiner

Melody M. Burch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9 is/are rejected.
- 7) ☒ Claim(s) 8 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 21 July 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the guiding tube 50 spirally encircling around the outer surface of the screw nut 31 as described in the specification on pg. 5 lines 22-23. As shown in figure 5 the guiding tube is shown to the right of element 31. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 8 and 10 are objected to because of the following informalities:
- In lines 8-9 of claim 8 the phrase "said first and second grooves" should be changed to --said first and second spirally threaded grooves-- to maintain consistent terminology.

Claim 10 objected to due to their dependency from claim 8.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5704250 to Black.

Re: claim 1. Black shows in figure 3 the use of a ballscrew with cooling means comprising: a screw bolt 16 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 54 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 62,64 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 30 cover the screw nut such that a cavity 86 being formed therebetween for a cooling agent to flow through thereby reducing the temperature of the screw nut by way of its connection to the reduced temperature of the motor 50.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3029792 to Rasmussen in view of US Patent 5344230 to Kowalczyk et al.

Re: claim 1. Rasmussen shows in figure 2 the use of a ballscrew with cooling means comprising: a screw bolt 40 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 30 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 23,25 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 10 cover the screw nut such that a cavity 13 being formed therebetween for an agent to flow through. Kowalczk et al. teach in col. 3 lines 7-9 the use of a nut member 14 being surrounded by an outer casing 15 to form a cavity 16 therebetween for introducing a fluid used specifically for cooling. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the agent in the cavity of Rasmussen to have included a cooling agent, as taught by Kowalczk et al., in order to provide a means of preventing overheating of the ball screw components and consequently preventing interference between the screw bolt and the nut due to thermal expansion.

Re: claim 4. Rasmussen show in figure 1 the limitation wherein an enlarged portion of the cavity shown between element numbers 11 and 13 is made between the screw nut and the outer cover.

7. Claims 1, 2, 3, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5809838 to Miyaguchi et al. in view of US Patent 5344230 to Kowalczyk et al.

Re: claim 1. Miyaguchi et al. show in figure 12 the use of a ballscrew with cooling means comprising: a screw bolt 1 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 2 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 3 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 18a cover the screw nut such that a cavity SS being formed therebetween for an agent to flow through. Kowalczk et al. teach in col. 3 lines 7-9 the use of a nut member 14 being surrounded by an outer casing 15 to form a cavity 16 therebetween for introducing a fluid used specifically for cooling. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the agent in the cavity of Miyaguchi et al. to have included a cooling agent, as taught by Kowalczk et al., in order to provide a means of preventing overheating of the ball screw components and consequently preventing interference between the screw bolt and the nut due to thermal expansion.

Re: claims 2 and 3. Miyaguchi et al. as modified, teaches in figure 12 of Miyaguchi et al., several leak proof elements 34 (left and right) provided between the screw nut and the outer cover for preventing leakage of the cooling agent.

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Re: claim 9. Miyaguchi et al. show in figure 12 an entrance pipe 43 with an opening 42 and an exit pipe with an opening shown immediately opposite element 43 formed in the screw nut for circulation of the agent.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3029792 to Rasmussen in view of US Patent 5344230 to Kowalczyk et al. as applied to claim 4 above, and further in view of US Patent 3169407 to Newell. Newell teaches in figure 2 the use of a screw nut 2 formed by paring a part of the screw nut into a planar shape. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the enlarged cavity portion of the screw nut of Rasmussen, as modified, to have included a part formed into a planar shape, as taught by Newell, as an obvious matter of design choice. Applicant has not disclosed that having the enlarged cavity portion being formed from a planar shape solves any stated problem or is for any particular purpose and it appears that the enlarged cavity portion would perform equally well with any shape that would result in the cavity being enlarged.

Allowable Subject Matter

9. Claims 8 and 10 would be allowable if rewritten to overcome the objection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments filed 7/21/03 have been fully considered but they are not persuasive.

With regards to Black, Applicant argues that Black lacks the limitation of a cavity between the screw nut and the cover. Examiner maintains that cooling passages 86 represent the claimed cavity. The cooling passages or cavity is formed between the screw nut and the outer portions of the outer cover as clearly shown in figure 3. It is also noted that the screw is cooled by way of its contact with the motor rotor and stator elements which undergo cooling.

With regards to Rasmussen, as modified, Applicant argues that there is no provision of a cavity portion for cooling. Examiner maintains that Rasmussen shows in figures 1 and 2 a cavity between the screw nut and the outer cover shown in the area of element numbers 13 and 14 having passages 11,12 for the entry and/or exit of an agent. Kowalczyk et al. is used for the teaching of an agent between a screw nut and an outer cover specifically being a cooling agent.

With regards to Miyaguchi et al., as modified, Examiner maintains that it is the combination of Miyaguchi et al. in view of Kowalczyk et al. that teaches the claimed invention. Miyaguchi et al. shows the cavity 55 being filled with an agent. Kowalczyk et al. is used for the teaching of an agent between a screw nut and an outer cover specifically being a cooling agent. Examiner maintains that, as broadly claimed, element 43 and the passage directly opposite element 43 represent the entrance and exit pipes.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melody M. Burch whose telephone number is 703-306-4618. The examiner can normally be reached on Monday-Friday (7:30 AM-4:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Lavinder can be reached on 703-308-3421. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

mmb 11/3/03
mmb
November 3, 2003


JACK LAVINDER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600